THE INFORMATION SOCIETY AND THE INTERNATIONAL TECHNOLOGY TRANSFER

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Abstract: The subject of this paper, based on the existing technologies, and on the wide frequency internet-access, is an analysis of the international technology transfer process using the e-learning concept, using traditional and modern methods and techniques and the IT&C technologies and leading to the understanding of the knowledge and abilities of this field. This paper points out the importance of the international technology transfer both between countries or firms, but also the essential role of the superior academic teaching in the workforce production. They should handle this international transfer and should also create a new technology that would eventually make the object of an international transfer and may serve the development of our society. Thus, central issue to this paper is the development of the information and communication science and technology that could create a new range of products and services, due to a more rapid innovation process. Managers should thus permanently consider exploiting the knowledge potential in order to ensure the competitive advantages and to increase productivity. A positive impact application amongst youngsters should consist in an interactive virtual environment, where participants could support the development of technological programs launched by the big companies in the field of high-tech.

1. Contemporary economy and technological exchange

1.1 General view of Informational Society-Knowledge Society

The society towards we are heading is and will be an Informational Society-Knowledge Society (IS-KS). This mainly relies on using Information and Communication Technology (ICT). The syntagm which designates the new society particularly points out the means on which it will rely on its progress, which, at first sight, gives the impression of one technicist, unilateral name. The syntagms which have defined societies until now, contain a key-word (slavery, feudalism, capitalism), which synthesizes a scale of possible social situations in which people, individual or/and in group, are inevitably placed, according to certain conditions, making a specific economic-social structure.

Nowadays, society is defined by the syntagm "new economy", which clearly presents the message of some profound changes which are taking place. Of course, the new economy supposes a lasting growth, but it induces another approach of this lasting growth, different from the one which was made so far.

Therefore, the new economy must start from the principles which were designed in various studies, from proper initiative or from practical reasons of international organizations which point out both the existent situation and requirements, immediate and future aspirations from which the counter reacting effects accumulated in the process of existence until now never missed. In our view, the most important principles found in the thematic literature are the following: the principles of human existence in closed circle (until the gain of extraterrestrial space); the principle of human reintegration in

nature; keeping and growing the biomass, biodiversity and bio-productivity; permanent ensuring of resources; the principle of economic, social and ecological efficiency; the society existence is interactive with the environment; the principle of social equity; responsible governments for the way in which, through promoted policies, they manage and increase the resources for insuring the future of new generations. The new economy is forming and it will function due to the democratic character of Informational Society-Knowledge Society.

The new economy will sanction technocracy, but this has to possess a good training, which induces the idea of insuring a priority in education and scientific research development. Significantly, *Friederich von Hayek,* said, many years ago, that: *"Only direct participants to economic processes possess the necessary knowledge for taking efficient decision".*

Learning becomes the general process specific to the new economy, because saving resources and directing actions to satisfy bigger and more diverse needs against limited resources, supposes knowledge, generalization, learning for all IS-KS members.

For achieving economy activities in a certain way, there must be knowledge in this sense, and for ensuring them, the knowledge must take place before economic action. ***Therefore, there is a priority for all the processes which generate new knowledge, and for technical-scientific research.*** The general result of learning must be an evident increase of general efficiency, and especially the economic one. Of course, at the same time, we have the problem of adequate measuring of economic processes, including efficiency itself, for gaining more relevance and accuracy in front of the respective processes.

1.2 The necessity of information and communication technology implementation (I&CT)

At the beginning of the third millennium we talk about informational society as a new stage in human civilization development, as a revolution of information and communication technology (ICT) and of labor nature. Adopting ICT in all activity domains represents the essential condition in developing every economy and providing the success of the informative society.

A must for setting up informative society is to understand new mechanisms and the rules which govern them, the objectives and possibilities to make work at distance an efficient way of production, in same way productive and free of drafts, routine and inefficiency. In the same measure it is about building new organizational, functional and social structures. That's why it is important to be studied and analyzed the effects of using the ICT in new methods of searching and innovating, labor and consumption.

Network economies grow productivity, which leads to an increase of potential result of economy (for example it could be obtained a rate of growing without inflation). Enlarged productivity can also lead to a short-term decrease of work places, if capital and good markets do not function efficiently and do not set up new activities, which transform potential result in real growth. In these conditions, dynamic capital markets are necessary, which support new companies, and a market of work-force which offers skilled and flexible personnel.

Electronic information and knowledge transmitted through computer networks had became central element, around which is organized the society, and that will be the final result in new social arrangement, with new rules, new methods of organization and new ways of thinking for governments and all economy sectors.

Synthesizing, we can affirm that productive system gets out from the shadow of economic model of standards, for entering in the world of specific, in which dominates co-production logic (integration client/costumer in process of conception and production). Also, it's important the interactivity and integration grade of knowledge's process, based on cognitive interactivity, in production process. Innovation is the safest method of development of high abilities, and hi-tech products with big added value. T&CI is not the only representative of hi-tech industry in a country, in competitively growing, and research development is important for a larger field of industrial components.

Therefore, research approach was centered on: a presentation of international transfer of technology, of its direct-indirect forms, and on its economic and social effects; and also on highlighting a partnership with the academic environment for adapting the curricular area of hi-tech sector to economy's needs.

Thus, a series of objectives must be followed: a faster development of advanced technologies in all economic sectors, and an implementation of lasting development of technology's directions at provincial level, the growth of company capacities to cope with the technological evolution component and European and international level competition; developing activities of research and innovation in enterprises, especially in hi-tech domains; promoting viable technological clusters, able to become competitors on world market, through support given to form and develop technological clusters/networks, including enterprises, research and developing institutions and universities with similar technological profile, especially at regional level, and through supporting strategic programs of technological development which were launched by important companies or industrial associations, especially in hi-tech domains.

2. Theoretical concepts and international transfer of technology importance

International technology transfer has an objective character, being determined by international labor division, by an increase of international cooperation in production, by specific contemporary evolution of world market resulted from recognition of the fact that technology represents an important factor of economic growth. Nations become more and more dependent on international economic environment, and, taking onto account the fact that it is more and more difficult to acquire, through personal efforts, the necessary technical-scientific equipment and knowledge, the practice of international technology transfer intensifies, in a rather alert pace, aiming at completing the differences which appear between the available technical potential and the economy necessities.

The expression "transfer of technology" is very often used. OECD (Organization for Economic Cooperation and Development) characterizes it as being: "the process through which innovations (new products or savoir faire) achieved in one country are transmitted in another country, in order to be used there". This expresses an ancient reality: human capacity of accumulating and transmitting knowledge to others through education. Technology is a current application of scientific and technical knowledge to PRODUCTION needs; it covers the information, competitions, methods, services and equipments' ensemble which are necessary to perform a given technique. Thus, technology includes, on the one hand, material elements which are easy to quantify (equipments, patents, licenses), and, on the other hand, a sum of knowledge and practice experiences, the know-how, whose evolution transmission are more delicate and difficult.

Philippe Le Tourneau militates for pointing out the fact that the notion of technology transfer is not sufficient. He considers that it is highly important a transfer of abilities, therefore the technical or industrial ability transfer, which permits the receiver to become independent. The genuine transfer of industrial ability involves the presence of the coordinates of three sine qua non and complementary conditions: firstly, technology transfer, secondly, a personalised, adaptive and permanent formation, and thirdly, technical assistance.

During international economic exchanges, an important role is held by human intelligence commerce. The essential element within this form of trade is the technological transfer or exchange. The new technology, know-how, brands, patents represent the activity of one part which is paid by the other one. Therefore, they are not made on the risk of each part, and their counter-services are not the success of common projects, but the remuneration. Thus, the parts have different interest, although they are converging.

In a strict sense, technology transfer is "communication against a remuneration of any technical knowledge still inaccessible to public and unpatented". However, in an extended sense, the expression appoints complex contacts, including, at the same time, a licence or patent and communication of know-how element necessary to its exploitation, scientific and technical elements, and, eventually, "the commercial savoir faire".

At present, due to an outstanding technical-scientific revolution and to the increase of economic interdependences between the states of the world, we register a remarkable increase of the importance of international technology transfer, giving birth to a genuine international flow of technology within world economic circuit, which had determined the formation of an international technology market.

Authentic technology transfer leads to a lasting and significant development since it permits the growth of its the capacities of the host-country in order to develop new technologies which are necessary for development.

In order to reach the planned goals within this research, the technology transfer is here defined as knowledge exchange, both organisational and technological, among partners (people, institutions, companies), which aims at growing and strengthening the force of each partner. The technology transfer takes place in all phases of the innovation process, starting from the creation of the product to the finality of the same product. Like the innovation process, technology transfer is a process made up of many steps, which could take place in informational interactivity among individuals, through forms of consultancy, workshop, staff exchange, common projects or licence measurable transactions, patents and inventions, and through research. Technology transfer could include certain regions, countries, nations from a continent or between continents.

Technology transfer may have direct or indirect forms. ***Direct transfer involves specific technologies or ideas, and common projects. Indirect transfer is a transfer of knowledge through publications, conferences and informative reunions.*** In the first phases, the indirect transfer takes place, while passing to the direct transfer is made in a rolling way. Direct and indirect transfers of technology are closely related to each other. Therefore, the efficiency of both forms of transfer is very important for a specific country. Another form of indirect transfer, which was created for a faster transfer of technology between universities, is the internet communication environment, which encourages the global free information exchange. Especially in the fields of research, the Internet proved to be effective, as reported to the fields of economy and business.

3. Economic and social efficiency of international transfer of technology

An analysis of technology transfer must take into account the differences between countries, regarding both the size and specific international market. The organisation and power of capital and work force markets, and other production factors must also be taken into consideration. All these factors have strong influences upon setting up investment systems, the technology transfer being part of them.

Technology transfer is closely connected to the research and development system of both countries and companies. Without a research, which implies achieving new knowledge, there is no technology transfer. ***For a better understanding, we are going to reproduce the link between direct and indirect transfer, meaning the presentation of universities role in technology, the role of technology exchange among universities and different economy fields, by promoting viable technological clusters, able to become competitors on the world market.***

3.1. Technology transfer from the hi-education

The main activity of universities is represented by education and basic, theoretical research. Beside this, it is necessary for any university or faculty to possess a practical research, too, for financing, from its incomes, other activities and also for giving the students the occasion to deal with different economy fields where they are likely to work in the future. **This contact is the first step to technology transfer between hi-education and practical economic activities.** The universities' role is not only a technology development one, but also the setting up of a new science, which leads to a new technology. That is why, in this case, we can speak about an innovation transfer, which can take place in a direct way through different cooperation projects with different companies, or in an indirect way, through publications and conferences, which are presented to the large public.

The main part of the research within a university is the primary, theoretical research, as well as the applied research, but in the long run. However, one can affirm that the primary research has, as a final goal, to apply the obtained results, because financing a project depends on the applicability grade. The researchers must look for investors for each project separately, who submit the project to an expertise analysis. This aspect promotes intensive competition, and at the same time it leads to a quickly exchange of ideas and results between researchers. This financing through projects with a practical character is a more and more used one.

First, there are informative contacts among higher education researchers, the ones in the industry and the managers through simple phone calls, very important for a successful technology transfer. These lead to an exchange of results and represent the grounds of cooperation forms.

At a deeper level, another very important way of technology transfer is represented by consultations and expertises made by professors. The consultations and expertises lead not only to a possible growth of researcher and manager knowledge, but also to an extra financial source, to maintain relations with future investors, as well as to the possibility of setting up diploma or doctorate researches.

Another effective technology exchange instrument between universities and industry is staff exchange. This exchange takes place during any research project. The method leads to a powerful relationship with industry, especially with companies in the project, even after the end of cooperation. This research cooperation is a more and more important instrument for technology transfer. These projects can also be privately or publicly promoted.

Technology transfer, at its turn, is achieved within certain institutes from universities, created for this purpose, which are independent, in order to have the necessary flexibility to adapt to the needs of industry.

3.2. International technology transfer evaluation and its economic efficiency

Innovation and technology transfer always determined lasting economic development. For being successful, technology transfer must aim at fulfilling the market with new or modernised goods, technologies and services. Technological innovation supposes, first of all, capitalising the technical creation, which is constituted as an integrant part of the general process of innovation. It refers to the assemble of technical, financial, production and market activities, involved in: introducing, within commercial circuit, new goods, technology or service; initial using of a certain production or process equipment; opening of a new market, identifying of new source of raw materials; re-organisation an economic domain at micro or macroeconomic level.

Technological innovations refer not only at new products and processes, but also to significant managerial methods of realising them. An innovation is considered implemented if it was introduced on market (in case of product motivation) or if it was used in a production process (in case of process innovation). No matter of its form, technological innovation must render the new product an extra value and a technological process, which should prove enough for ensuring its commercial success.

The complete innovation process supposes the creation of "new" and its implementation. The implementation can be directly achieved, or indirectly, through technological transfer or market. That is why innovation supposes a series of scientific activities or research - technological, organisational, financial and commercial development.

Rapid technology transfer from one development level to another involves the existence of the following three essential pre-requisites: the potential users of technology transfer to have the knowledge of the science and technique development level; the existence of a social order for making technology transfer; the existence of an entrepreneur who should take the inherent risk of technological development.

Enterprise development in industrialised economy was focused on the use of infrastructure and concrete assets. More recently, corporations have started to model the processes referring to these assets management to increase the created value. During the last decade, the companies continuously improved these processes and they integrated them, firstly by using the ERP system, and then by extension to CRM, SCM and e-business solutions. The result was a global infrastructure, technologies and processes able to manage the globalisation of the market, the products, and the costumers.

Economic effects can be direct – they can be identified at the level of the achieved product and they are based on direct investment - and indirect, due to a conduction effect in other activity sectors. The correlation between efforts and effects, from quantitative point of view, can be expressed through efficiency indicators, which, most of the time, have a mathematical ratio form. The use of efficiency indicators is necessary to emphasize all the possible correlations. The construction of an indicator system requires a laborious work of identifying and quantifying all the allocated or used resources and types of generated effects. The effort/effect matrix proves to be useful in this case. It is a square matrix, in which the number of rows/columns is represented by the effort or effect indicators, which are identified as being specific to the analysed activity:

	Efforts (resources)	Effects (results)
Efforts	Dial I	Dial II
Effects	Dial III	Dial IV

Each dial contains a certain type of economic efficiency indicator:

a) effort/effect indicator type (dial I), such as: cost of a workplace, level of technical equipment etc.; b) effect/effort indicator type (dial II), such as: benefits at 1 euro investment, production reported to 1000 euros fixed assets, etc.; c) effect/effort indicator type (dial III), such as: specific investment, expenses reported to 1000 euros production etc.; d) effect/effort indicator type (dial IV), such as: benefit reported to 1000 euros income, revenue course etc.

Following the investment effort in technology transfer, different economic effects can be obtained, also reflected in a financial plan. The level of these effects, reported to the investment effort gives the measure of investments efficiency in technology transfer.

The obtained economic effects, depending on the investment character, can be: reduction of equipments function costs, based on machines and equipments replacement investments; reduction of work-force expenses, especially obtained from improvement investments and innovations; growth of the profitability of company's activity, through investments development, which leads to increased production capacity and/or adding a new product to the existent assortment; these investments are expected to bring extra-gains, much bigger than the ones coming from costs' move; reaching such effects in the long run and often during indirect periods, for strategic and national interest investments.

Starting from the idea of "Live meeting", a solution also offered by Microsoft through the programme "Microsoft Office Live Meeting", I consider that an application with a positive impact, especially among young people, students or employees, consists in creating a live interactive environment, for example a class of courses, in which the participants should support strategic programs of technological development launched by large companies or industrial associations, especially in hi-tech domains.

Foe achieving that purpose, the components which are generally used to manage an e-Learning system must be displayed. These are: systems regarding the management of information (Management Information System - MIS) - these refer to different activities carried out by secretariat, library and administrative system; Content Management System (CMS) – these are environments used by the persons who develop e-Learning to be able to create, stock, reuse, administrate or offer digital content in a central store-house. CMS are used in present, for example, to manage big web-sites, which means that they automatically follow step by step the life cycle of one web page; Learning Management System (LMS) - these can be systems with different functions, from simple administration of schedule, to systems that administrate students' marks and assessment. Usually, they are structured according to the type of course and not to their content. Learning Content Management Systems (LCMS). LMS and LCMS achieve different things. They can work together or separately. LCMS is destined to learning objects (LO) and it permits a more precisely adaptation of learning to individual needs of the users. LCMS achieve storing, combining and delivering learning objects.

The specific particularities to e-Learning technologies bring new dimensions in education, which can be complementary or alternative to traditional methods in learning domain, these particularities offering the possibility of organising education on subjects or themes, thus having benefic consequences especially for the economy.

The process of teaching-learning-evaluating gets new dimensions and characteristics through using e-Learning technologies. The education system from our country is directly and strongly involved in substantiating and building informational society. Informational societies appears in an environment where most of its members

have access to IC&T technologies and frequently use informational technologies regarding the solution to some economic, social and other problems.

Building an informational society, which will represent the step to knowledge society, cannot be achieved without research and investment projects, in IC&T domain. The final desideratum being competition, no technology, no theory and no approach will eliminate or neglect the relation teacher/student. These will be comfortable and efficient instruments, for teachers and students, to develop work-team capacities, in real time and at global scale, in which the individual affirms his personality, continues developing, thus becoming the main vector of a new society, the informative society.

An important topic of my paper is the development of science and technology of information and communication. This offers a great potential to create new goods and services, innovation being faster and faster. Managers should permanently think about the most ingenious way of creating and exploiting the assets of knowledge in order to provide competitive advantages, to develop productivity, and to be highly competitive.

Therefore, it is necessary that companies should be more flexible and more innovative, administrating the assets of knowledge in an effective way for having new sources of competitive advantages. Companies should cooperate more, and form networks, especially based on new technologies, and to strengthen their links with scientific and engineering base, sharing equipments and often people.

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